Scope and Application Guide

COM*check-EZ*™

January 1997

COM*check-EZ*™ is an optional way to demonstrate compliance with commercial and high-rise residential building energy codes. COM*check-EZ* applies to most commercial and high-rise residential buildings three stories or more above grade. A building designed and constructed to meet the COM*check-EZ* requirements generally meets or exceeds the energy efficiency of a similar building constructed to meet *ASHRAE/IES Standard 90.1-1989* requirements.

The COM*check-EZ* materials simplify and clarify energy code requirements. COM*check-EZ* has a different format than *ASHRAE/IES Standard 90.1-1989*. Redundant provisions and those having no impact on overall energy performance were deleted during COM*check-EZ* development. COM*check-EZ* may be used only in jurisdictions where the adopting authority has approved its use.

COM*check-EZ* includes a manual method (prescriptive compliance path) and software method (system performance compliance path). You can use either method to demonstrate and document that your proposed building design complies with the COM*check-EZ* requirements.

When applying for a building permit, only construction subject to the building permit application must comply at that time with the COM*check-EZ* requirements. Each envelope, mechanical, and lighting system (electrical permit) can comply separately. For example, if the building permit application is for only the lighting system, then the COM*check-EZ* envelope and mechanical provisions do not apply at that time.

COM*check-EZ* can be used in conjunction with other energy codes. COM*check-EZ* requirements can be mixed with other energy code requirements only if separate permits are being requested for each system (envelope, mechanical, and electrical). In this case, COM*check-EZ* is designed to allow a building to comply using requirements contained in another energy code if a separate permit is being requested for the system covered by the other code. For example, an applicant can apply for a shell permit using COM*check-EZ* for the envelope requirements. When requesting a permit for the mechanical system, the applicant can use either the COM*check-EZ* or another energy code requirements approved by the local jurisdiction.

This guide provides an overview of the COM*check-EZ* materials and explains how the COM*check-EZ* requirements apply to a variety of commercial-building situations. All COM*check-EZ* users should read this guide because it applies to all portions of a building design.

SPECS INSIDE

You can access a U.S. Department of Energy Building Standards and Guidelines Program (BSGP) web site at http://www.energycodes.org to learn about the COM*check-EZ* compliance materials and get free downloads of the complete package of guides and software. If you have questions about the COM*check-EZ* compliance materials, call the BSGP hot line on 1-800-270-CODE.

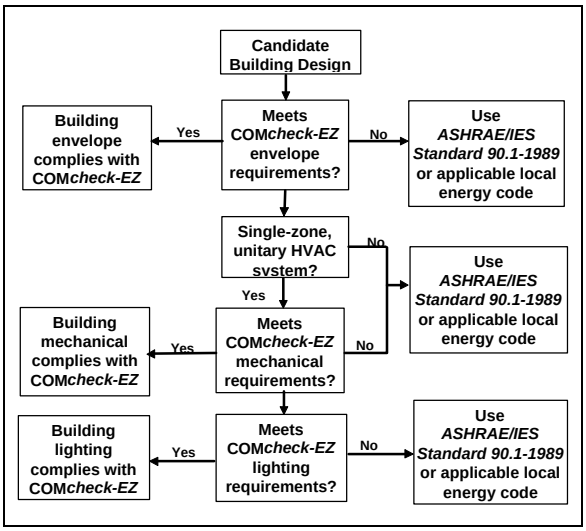
COM*check-EZ* Materials

The COM*check-EZ* materials include the following:

- *Envelope Compliance Guide*
- *Mechanical Compliance Guide*
- *Lighting Compliance Guide*
- *Software Compliance Guide*
- *Field Inspection Checklist*

Specific COM*check-EZ* requirements are discussed in the Envelope, Mechanical, and Lighting Compliance Guides. Architects, engineers, designers, and contractors can use these guides to demonstrate compliance with energy efficiency requirements. Software users can use the COM*check-EZ* software to demonstrate compliance. Local building officials will find the *Field Inspection Checklist* useful when inspecting COM*check-EZ*-compliant buildings.

The next version of COM*check-EZ* will include a *Plan Check Guide* containing example forms and instructions on how to document compliance with the COM*check-EZ* requirements.



Steps to Determine Compliance

Envelope Compliance Guide

The *Envelope Compliance Guide* contains energy efficiency requirements related to the building envelope. Requirements are included for limiting air leakage through the building envelope, certifying building components, and installing vapor retarders. This guide also contains climate-specific requirements such as required insulation levels for walls, roofs, and below-grade walls and glazing areas and U-factors for windows and skylights.

Mechanical Compliance Guide

The *Mechanical Compliance Guide* contains energy efficiency requirements for heating, cooling, ventilating, and water heating. Included are requirements for heating and cooling system controls, outdoor-air ventilation, duct construction, water-heating systems, and swimming pool heaters. This guide also contains instructions for trading off economizers with higher-efficiency cooling equipment and recommendations for documenting that your mechanical design meets the COM*check-EZ* requirements.

Lighting Compliance Guide

The *Lighting Compliance Guide* contains basic energy efficiency requirements for lighting systems. This guide identifies control, switching, and wiring requirements and types of exterior-lighting sources that comply. It also shows you how to demonstrate compliance with building- or area-specific interior-lighting power limits.

COM*check-EZ* Software

The COM*check-EZ* software provides a highly flexible way to demonstrate compliance with minimal input. The software is designed to run on most DOS- and Windows-based computers. The envelope portion allows roof, wall, window, floor, and skylight performance tradeoffs within the permit stage. The lighting portion allows you to quickly determine if your lighting design meets the COM*check-EZ* interior-lighting power limits. The heating, ventilating, and air-conditioning (HVAC) portion displays a checklist of mechanical requirements and prints this checklist in the form of a mechanical compliance certificate. The software automatically generates a report that can be affixed to project plans and submitted to enforcement personnel to document compliance. Refer to the

COM*check-EZ Software Compliance Guide* for instructions on installing and using the software.

Field Inspection Checklist

The *Field Inspection Checklist* helps ensure that required energy efficiency measures are properly installed in the building in accordance with the building plans and specifications.

COM*check-EZ* Building Types

You can use COM*check-EZ* to determine compliance for most commercial-building types. It cannot be used for R-3 buildings and R-2 residential buildings three stories or less above grade.

Applicable buildings include

- offices
- retail, grocery, and wholesale stores
- restaurants
- assembly and conference areas
- industrial work buildings
- commercial or industrial warehouses
- schools and churches
- theaters
- apartment buildings and condominiums with four or more habitable stories
- hotels and motels.

COM*check-EZ* requirements do not apply to

- very low energy use buildings (less than 3.4 Btu per hour per square foot or 1 watt per square foot of floor area)
- buildings or portions of buildings that are neither heated nor cooled
- buildings designated as historic.

COM*check-EZ* Applications

The following sections explain how COM*check-EZ* applies to a variety of typical building situations. While these examples can help illustrate various code applications, your local building department has the final authority on how to apply COM*check-EZ* to a project.

Unconditioned Spaces

Unconditioned spaces are exempt from the COM*check-EZ* envelope requirements. Unconditioned spaces may contain limited heating or cooling equipment. This equipment must meet the COM*check-EZ* mechanical or lighting provisions. To determine if a space is unconditioned, ask the following questions:

- Does a heating or cooling system currently serve the space?
- Does the heating system capacity exceed 10 Btu per hour or the cooling system capacity exceed 5 Btu per hour per square foot of floor area?
- Is the temperature controlled for human comfort between 50°F and 90°F?
- Is the heat transfer from the space to the outdoors greater than to an adjacent conditioned space?

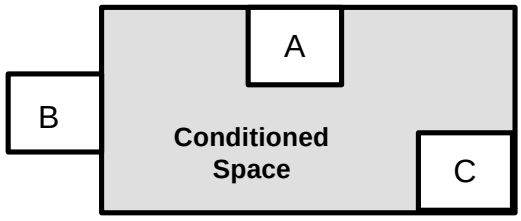
If the answer is no to any of the above questions, the space is unconditioned.

Newly Conditioned Spaces

When an unconditioned space becomes conditioned, the space is considered an addition. All envelope, lighting, and mechanical systems and components associated with the addition must comply with the COM*check-EZ* requirements as if the addition were a new building.

Question

The sketch below shows a building with four different spaces. Spaces A, B, and C do not have installed heating or cooling equipment. Are any of these spaces exempt from the COM*check-EZ* requirements?



Answer

Space B is exempt. Heat transfer is based on the wall area and the amount of insulation in the walls separating conditioned space from unconditioned space or the outdoors. Space A is surrounded by conditioned space on three sides. Space C is surrounded by conditioned space on two sides. The heat transfer between the conditioned space and spaces A and C is greater than or equal to the heat transfer to the outdoors. Spaces A and C are considered conditioned spaces and thus must meet the COM*check-EZ* requirements. Space B does not have to meet the COM*check-EZ* requirements because the heat transfer to the outdoors is greater than the heat transfer to the conditioned space.

A problem occurs when a building owner erects an unconditioned shell building and fails to comply with energy efficiency requirements. When a future tenant applies for a permit to install heating and cooling equipment, the building envelope must be brought into compliance, possibly requiring significant alterations. The lighting system, if installed in conjunction with the shell building, must also be brought into compliance in a similar situation.

Many local jurisdictions require that building owners sign an affidavit when applying for the initial building permit for a shell building. The owner acknowledges in the affidavit the potential difficulties associated with postponing envelope or lighting compliance. To minimize these difficulties, permit applicants should demonstrate compliance when each system is installed.

New Construction in Existing Buildings

Tenant improvements in an existing building (the base building has been constructed, but the individual tenant spaces have not been completed) are considered new construction. All envelope, lighting, and mechanical systems and components being installed must comply with some or all of the COM*check-EZ* requirements.

Existing systems and components not subject to the current permit application must comply with the COM*check-EZ* requirements when conditioning previously unconditioned space.

Alterations to Existing Conditioned Spaces

Alternations to existing conditioned spaces must comply with the following criteria:

- Altered portions of a system must comply with the COM*check-EZ* requirements; unchanged portions do not have to comply.
- If an alteration increases the altered system's energy use, the alteration must comply with all of the COM*check-EZ* requirements applying to that system.
- Each altered component must meet the requirements applying only to the altered component.
- New systems in alterations must comply with the COM*check-EZ* requirements.

In most cases, existing envelope, lighting, and mechanical systems and components set the requirements for alterations. For example, envelope alterations comply if the overall performance of the envelope is not degraded. Similarly, lighting alterations comply if the building's overall connected lighting load does not increase. Mechanical alterations are governed primarily by the requirements for each altered component.

Question
A building owner wants to install a new window in an old building, which will increase the glazing area. How can COM*check-EZ* help demonstrate compliance?
Answer
The new window will degrade the overall building performance. Therefore, the increased glazing area must be offset with other envelope improvements. You can use the COM*check-EZ* software to show that additional insulation will offset the added glazing by ensuring the building's compliance margin with the new glazing is at least as large as its compliance margin without the new glazing.

Question
A building owner wants to rearrange some interior partitions and reposition the light fixtures in the affected rooms. Do any COM*check-EZ* requirements exist for this alteration?
Answer
Because no change exists in the connected lighting load, only the control, switching, and wiring requirements apply. For example, each newly arranged room must have a light switch, and any one- or three-lamp ballast must be tandem-wired.

Additions

Additions are newly constructed conditioned spaces or previously unconditioned spaces after heating or cooling equipment has been installed. All additions must comply with the COM*check-EZ* requirements.

Envelope, lighting, and mechanical systems and components in additions are treated the same as they are for new buildings. Existing systems simply extended into an addition do not have to be brought up to COM*check-EZ* efficiency levels.

For additions, the following two options can be used to demonstrate compliance:

1. Treat the addition as a stand-alone building and ignore the common walls between the existing building and the addition. You can use either the COM*check-EZ* manual or software method to demonstrate compliance for this option.
2. Combine the existing building with the addition. You can use only the COM*check-EZ* software method to demonstrate compliance for this option.

Buildings with Multiple-Occupancy Types

COM*check-EZ* addresses buildings with multiple-occupancy types as follows:

- **Minor Occupancy** - If an occupancy type takes up less than 10 percent of a building's conditioned floor area, then the area devoted to that occupancy must meet the same requirements as the major-occupancy type.
- **Multiple and Single Occupancy** - COM*check-EZ* uses the same compliance process for commercial buildings with multiple-occupancy types as for those with a single-occupancy type. The manual and software methods allow you to specify several occupancy types.
- **Hotel/Motel and Commercial Occupancy** - COM*check-EZ* uses the same compliance process or hotel/motel-occupancy and commercial-occupancy types as it uses for multiple-occupancy and single-occupancy types.
- **Mixed Residential and Commercial Occupancy -** This occupancy type occurs when a building has three or fewer stories and contains both residential and commercial occupants, with the minor-occupancy type taking up more than 10 percent of the building's conditioned floor area. The residential and commercial occupancies are considered separately because they fall under two different scopes. Thus, two compliance submittals must be prepared using the appropriate calculations and forms from the respective codes for each.

Change in Occupancy

COM*check-EZ* requirements generally do not apply to occupancy changes. However, if physical changes are made to the building, the rules for alterations or additions may apply. Your local building official will need to evaluate these changes on a case-by-case basis to determine energy requirements.